Influence of Stimulus Meaning on Recognition Memory

Julia Beth Proffitt (juliabeth@nwu.edu)
Department of Psychology; 2029 Sheridan Road
Evanston, IL 60208 USA

Linda L. Liu (lindaliu@nwu.edu)
Department of Psychology; 2029 Sheridan Road
Evanston, IL 60208 USA

Introduction

It is nearly a truism to state that meaningfulness improves memory. Stimulus meaningfulness is widely reported to improve free recall (Bower, Clark, Lesgold, & Winzenz, 1969), recognition memory (Bach & Underwood, 1970), and figure recognition (Mandler & Day, 1987). We propose that the well-documented advantage of stimulus meaning is not absolute and that the extent to which meaning improves memory greatly depends on the nature of the memory task.

Recent research has explored the phenomenon of false memory, defined as the erroneous retrieval of nonpresented, but associated, information with presented stimuli (Roediger & McDermott, 1995). This study investigated the mediating role of meaning on the incidence of such false memories.

Specifically, we suggest that meaningfully encoding pictures may be detrimental to recognition when distractors are semantically related to previously seen items. In this situation, we expect semantic distractors to be falsely remembered.

Methods

We assembled a set of 16 tangram pictures (Figure 1).

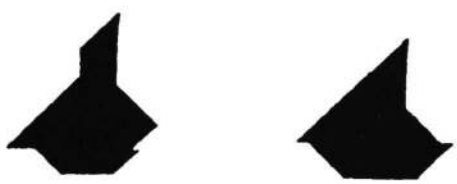

Figure 1: Examples of two semantically related tangrams
All pictures were composed of the same seven geometric shapes.

We varied access to meaning by presenting tangrams crossed on three dimensions: labeling (labeled or unlabeled), orientation (upright or upside-down), and difficulty (easy or hard to interpret, as determined by pretesting).

Participants studied a series of target tangrams presented sequentially on a computer monitor for 1 sec. "Labeled" tangrams were presented with a category label identifying the picture. Participants made old-new judgments about a second set tangrams including the target pictures and two types of nonpresented distractors. Semantically related distractors shared the same identity but were different instances of targets. For example, when a cat was the target, a different picture of a cat would serve as its semantic distractor. Unrelated distractors depicted objects conceptually distinct from the targets.

Results

Preliminary findings revealed that, as predicted, increased access to meaning increased the incidence of false memory. Correct responses on the old-new recognition task consisted of responding "old" to a target and "new" to either type of distractor. The percentage of correct responses was higher for target items for all three pictures types in which access to meaning was high (i.e., upright, labeled, and easy).

The opposite pattern holds for the semantically related distractors. The percentage of correct responses was lower for semantic distractors when access to meaning was high. That is, participants failed to correctly reject semantically-related distractors. These findings suggest that conditions that encourage meaningful encoding may also encourage participants to falsely recognize pictures that were never presented.

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